

Northern Colorado BUSINESS REPORT

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Czero Inc. sets sights on global applications

By Kristen Tatti

FORT COLLINS - Northern Colorado's newest addition to the clean-energy cluster has its sights set on going global.

Czero Inc., a research and development consulting company with a focus on the automotive industry, was founded in January. The company consists of two engineering consultants right now, but aspires to reach across the globe to make a difference in the developing world.

"They fit in great," said Judy Dorsey, director of the Northern Colorado Clean Energy Cluster. The clean-energy cluster has identified two technology platforms on which to focus its efforts - smart grid technologies and transportation - where Czero's focus on the automotive industry makes a match.

Dorsey first met Czero founder Guy Babbitt last year at a cluster-sponsored renewable energy summit in Denver. At the time, Czero had not yet coalesced, but Babbitt contacted Dorsey again when the company and its direction were more concrete. He remembered Dorsey mentioning the resources available to startups.

"In his case, we were able to help a startup learn the lay of the land," she said. "Among other things, I suggested the company move to Northern Colorado."

Czero, founded in Babbitt's home in Colorado Springs, is now tapped into many of the resources Northern Colorado has to offer. The company is working with Colorado State University's College of Business, College of Engineering and Engines and Energy Conversion Laboratory; the clean-energy cluster; and the Fort Collins Innovation Center, formerly known as the Fort Collins Technology Incubator.

"We worked hard to get into the incubator," Babbitt said.

Czero is one of several companies to recently join the innovation center. The company will rent space at a below-market rate in a building owned by the city of Fort Collins, and Babbitt said he will soon be moving to the Fort Collins area.

While the company is small now, it has already identified some big aspirations.

"Our goal is to morph it from a consulting company to an engineering company," he said.

Many projects

Right now, Czero's biggest customer is Fort Collins-based Solix Biofuels. Chris Turner, vice president and chief engineer, is spending much of his time now working with Solix in its efforts to develop a fuel produced by algae.

Babbitt has served as the acting engineering director for Solix, but has been devoting part of his time and a new hydraulic hybrid project. Czero is working with CSU business and engineering

students on the project that could be used to reduce fuel consumption and emissions in dynamically driven vehicles.

Babbitt explained that a hydraulic hybrid system works like an electric hybrid system in that the hydraulics are used to power the motor during certain times. The hydraulic system is charged when a vehicle brakes by pushing fluid into a tank. The system is then reversed, releasing the energy for vehicle acceleration.

The main difference between the electric hybrid and hydraulic hybrid, from a power point of view, is that the power provided by an electric battery lasts longer, but the hydraulic system can supply a high amount of energy very quickly. The system lends itself to high efficiency in vehicles that make frequent stops and require a lot of power to accelerate from a stop, such as city buses, trash trucks and mail delivery vehicles.

Czero is trying to develop an economically feasible hydraulic system that can be retrofitted to work in conjunction with a vehicle's existing power structure.

Babbitt explained that there are several large companies exploring hydraulic hybrid systems, but that they are focused on the original equipment manufacturer market. The retrofit system will not only differentiate the company from the competition, but also will allow Czero to implement the technology in developing nations, where pollution in cities is a major problem.

Familiar model

If this business model sounds a little familiar, it should. Czero hopes to use the model that has worked so well for Envirofit International. Envirofit, founded on a technology developed at CSU, is retrofitting two-stroke engines in several Asian countries to make them more fuel efficient and less polluting. Czero is working with a number of the key players who helped get Envirofit off the ground.

"This is like Envirofit, for a bus," joked Paul Hudnut, one of the co-founders of Envirofit. He added that there really are some new challenges for Czero.

The biggest difference for Czero will be its customers. Envirofit's retrofits were targeted toward taxi drivers who are relatively poor. Czero's customers will be government entities or companies, which, Hudnut explained, will present different marketing challenges.

Hudnut, a man of many hats, is working with Czero through CSU's new Global Social and Sustainable Enterprise Program. The business master's degree program is in its first semester. Hudnut, director of the GSSE, said that students are assigned to projects to work on throughout the 18-month program. Two students began working with Czero in late October.

The business students are charged with crunching the numbers and evaluating the feasibility of the business model. At the same time, Czero has tapped the College of Engineering and the Engines and Energy Conversion Laboratory for assistance on the technical side.

Babbitt said that Czero's technology has been formulated into a student project. The company has tapped three electrical engineering students and nine mechanical engineering students to help advance the hydraulic hybrid design. The students work with Czero at the Engines Lab, which is headed by Bryan Wilson, another Envirofit cofounder. Babbitt said that Wilson has also been instrumental in assisting with Czero's hydraulic project.

All of this activity has come together in the past few weeks, but the company is already looking ahead. Babbitt said he hopes the company will be able to attract grants to sustain it for the next six to 12 months. During that time, Czero aims to finalize a prototype and have an idea of the economic feasibility of the project.

Clean-energy applications

Just because Czero is dedicated to launching its hydraulic hybrid retrofit to help developing companies does not mean that the technology will not be seen domestically. Babbitt said that a domestic rollout is not out of the question, but that the numbers still have to be crunched to see if it would work.

Local residents might be the first to lay eyes on the technology, though.

"Our work is very initiative focused," Dorsey said of the clean-energy cluster. Since its launch in May 2006, the cluster has involved itself in and initiated an intelligent grid simulation demonstration project, an algae-based biofuels project, an emerging solar technology program and a working farms initiative based on increased use of wind energy and biofuels.

Dorsey said that the cluster is considering looking at supporting Czero's hydraulic hybrid project as an initiative in 2008. She explained that the group would likely be involved in coordinating a local demonstration of the technology.

Hudnut said that Czero's work is important on a local level because it shows the region's commitment to the clean-energy cluster.

"CSU is proud to be a part of that," Hudnut said.

Babbitt gets the feeling that Fort Collins, as a whole, is proud to be a part of it.

"The amount of support we're getting from the Fort Collins community is just incredible," he said. "The whole community just wants this thing to succeed. It's amazing."